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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,567	12/08/2003	Kevin W. Rudd	42P17887	5070

7590 06/14/2006
Dennis A. Nicholls
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1030

EXAMINER

TREAT, WILLIAM M

ART UNIT	PAPER NUMBER
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2181

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,567

Applicant(s)

RUDD ET AL.

Examiner

William M. Treat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-27 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 11 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/8/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. Claims 1-31 are presented for examination.
2. The drawings are objected to because Figs 5A and 5B have not been properly labeled as Prior Art. They depict nothing but configurations of prior art Intel systems. See Fig. 1 of Huff et al. (Patent No. 6,052,769) and Fig. 2 of Watson et al. (Patent No. 6,466,226). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 5, 7, 10, 12, 14, 17, 27, 29, and 31 are rejected under 35

U.S.C. 102(e) as being anticipated by Shimada (Patent No. 6,687,812).

5. Shimada taught the invention of exemplary claim 1 including a processor comprising: a fork predictor to issue a prediction whether a fork instruction should be permitted to execute; and an execution unit to execute said fork instruction responsive to said prediction (Col. 7, lines 15-58 and Col. 8, line 39 through col. 9, line 9). Note that Shimada discusses his fork prediction unit as both prediction unit and execution unit for the speculative fork instruction. Note also that Shimada's description makes clear that the hardware to predict and the hardware to execute the speculative fork instruction can be seen as separate entities. Whether one interprets Shimada's fork prediction unit as being a unit which acts as both a prediction unit and an execution unit or as merely a name for two hardware entities where one entity predicts and the other executes, both interpretations meet the limitations of applicants' claim language.

6. As to claim 2, Shimada taught the processor of claim 1, wherein said fork predictor includes a prediction logic to issue said prediction based upon execution history of speculative threads (col. 7, lines 42-49).

7. As to claim 5, Shimada taught the processor of claim 2, wherein said fork predictor includes an update logic to receive a first calculated determination whether a first one of said speculative threads was executed desirably (col. 9, lines 15-59).

8. As to claim 7, Shimada taught the processor of claim 5, wherein said update logic is to receive a second calculated determination whether a second one of said speculative threads would have been executed desirably when said second one of said speculative threads was not executed (col. 9, lines 15-59).

9. As to claim 10, it fails to teach or define over rejected claims 1-2, 5, and 7.

10. As to claim 12, Shimada inherently taught the method of claim 10, further comprising joining said speculative thread and a master thread when said speculative thread and said master thread are both complete. Unless the successful results of both thread executions are joined the parallel execution of both threads is wasted.

11. As to claim 14, it fails to teach or define over rejected claims 1-2, 5, 7, 10, and 12.

12. As to claim 17, Shimada taught the method of claim 10, further comprising initiating a recovery if said determining shows that said speculative execution was not successful (col. 9, lines 30-48).

13. As to claim 27, 29, and 31, they fail to teach or define over rejected claims 1-2, 5, 7, 10, 12, 14, and 17.

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 6, 8-9, 13, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada (Patent No. 6,687,812).

17. Claims 6 and 8-9 depend from rejected claims 1-2 and 5 which were taught by Shimada (see the preceding paragraphs). Claim 13 depends from rejected claims 10 and 12 which were taught by Shimada (see the preceding paragraphs). Claim 30 depends from rejected claims 27 and 29 which were taught by Shimada (see the preceding paragraphs).

18. As to claim 6, Shimada taught a retirement unit (col. 8, line 42) and update logic (col. 7, lines 30-35). He does not teach his write-back/retirement stage transferring update information to the update logic. However, the examiner takes Official notice of the fact that the model of using the write-back/retirement stage to transfer update information to the update logic for branch history information such as the fork history information is an old and conventional technique in the art. One is motivated to use such a conventional technique because it is compatible with many processor designs, is well-known and understood, and is, therefore, readily implemented by one of ordinary skill.

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19. As to claim 8, Shimada clearly taught a determination is made as to whether a first one of said speculative threads executed desirably (col. 9, lines 15-59). It is unclear whether Shimada uses merely a hardware device or an instruction or a microcode-implemented instruction to make the determination. However, the examiner takes Official notice of the fact that the model of using an instruction to determine whether a speculative branch-type of instruction such as a speculative fork instruction executed desirably is an old and conventional technique in the art. One is motivated to use such a conventional technique because it is compatible with many processor designs, is well-known and understood, and is, therefore, readily implemented by one of ordinary skill.

20. As to claim 9, see paragraph 18, *supra*. Also, the conventional time for determining whether a speculative branch-type of instruction such as a speculative fork instruction executed desirably would be when deciding whether to join the results of the main thread's and the speculative thread's execution.

21. As to claims 13 and 30, they fail to teach or define over rejected claims 1-2, 5-10, 12, 14, 17, 27, 29, and 31.

22. Claims 3-4, 15-16, and 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada (Patent No. 6,687,812) in view of applicants' specification.

23. Claims 3-4 depend from rejected claims 1-2 which were taught by Shimada (see the preceding paragraphs). Claims 15-16 depend from rejected claim 10 which was taught by Shimada (see the preceding paragraphs).

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24. As to claims 3-4 and 15-16, applicants taught on page 8, lines 2-3, that using local history information and/or global history information in predicting a speculative branch-type of instruction such as a speculative fork instruction is an old and conventional technique in the art. Shimada would have been motivated to use such conventional techniques for his history because they are compatible with many processor designs, are well-known and understood, and are, therefore, readily implemented by one of ordinary skill.

25. As to claims 18-26, they differ from rejected claims 1-10, 12-17, 27, and 29-31 only in their mention of a chipset coupled to the processor to convey input-output data from an input-output peripheral and an input-output peripheral including an audio input-output device which applicants show in their Prior Art Fig. 5B. Shimada would have been motivated to incorporate his system in such a prior art device to enhance its throughput and expand the market for his invention.

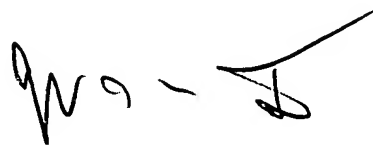
26. Claims 11 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. Any inquiry concerning this communication should be directed to William M. Treat at telephone number (571) 272-4175.

28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Wm. Treat', with a stylized flourish at the end.

**WILLIAM M. TREAT
PRIMARY EXAMINER**